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REMARKS

This application has been reviewed in light of the Office Action mailed March 23, 2007.

Reconsideration of this application in view of the below remarks is respectfully requested.

Claims 1 – 19 are pending in the application with Claims 1, 5 and 12 being in independent form.

By the present amendment, Claims 4, 5, 12 and 13 are amended. No new subject matter is introduced into the disclosure by way of the present amendment.

I. Objection to the Abstract

The abstract of the disclosure has been objected to for containing legal phraseology. In response, the abstract has been amended as follows:

An ultrasonic puncture needle is disclosed having a sheath for insertion into a treatment tool insertion channel of an ultrasonic endoscope, and a needle tube for insertion into tissue within the body cavity through the sheath. The needle tube includes multiple staggered-array doughnut-shaped recesses over a predetermined range on the surface of the tip portion from the portion near the tip thereof.

II. Objection of Claims 4, 5 and 12

Claims 4, 5 and 12 have been objected to for informalities. Specifically, Claims 4, 5 and 12 recite: "an cutting-tip", however the phrase should properly read "a cutting-tip". Accordingly, the claims have been amended to correct this grammatical error.

III. Rejection of Claims 1 – 19 Under 35 U.S.C. § 103(a)

Claims 1 – 6, 9, 12 – 16 and 18 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,759,154 issued to Hoyns in view of U.S. Patent No. 6,238,336 issued to Ouchi; and Claims 7 – 8, 10 – 11, 17 and 19 are rejected under 35 U.S.C. § 103(a) over Hoyns in view of Ouchi and further in view of U.S. Patent No. 4,401,124 issued to Guess et al.

However, Hoyns, Ouchi and Guess taken alone or in any proper combination fail to disclose or suggest Applicant's claimed plurality of staggered-array doughnut-shaped recesses

over a predetermined range on the surface of the tip portion of the needle tube from the portion near the tip of the needle tube.

Specifically, Hoyns discloses octagonal, or square and diamond-shaped recesses formed on a needle, but no disclosure or suggestion is found of donut-shaped recesses formed on the needle. Ouchi is limited to disclosing an ultrasonic endoscope with no reference made of forming recesses of any kind on a needle tip portion. Guess, discloses a spiral groove formed on a needle tip, not a plurality of donut shaped recesses.

Fig. 6 of Hoyns, shows a plurality of octagonal depressions around the shaft 11 at the distal side. (While the specification of Hoyns sets forth the depression 214, the reference numeral is erroneously provided as 114 while the depression should have been provided with reference numeral 214 in Fig. 6.)

As shown in Applicant's FIG. 1A and FIG. 1B, the recess recited in Claims 1, 5 and 12 is a doughnut-shaped recess. In contrast to this, the depression in Hoyns is an octagonal depression as shown in FIG. 6 or the rectangular depression as shown in FIG. 1 and FIG. 1A, of Hoyns, or the so-called diamond-shaped depression that is the one by turning the square depression by 90 degrees.

The purpose for the doughnut-shaped recess recited in Claims 1, 5 and 12 is to improve the visibility of the puncture needle under ultrasonic image observation. The important factor that relates to improving the visibility of the puncture needle under ultrasonic image observation is the ability to return most of the ultrasonic wave reflected on the surface of the puncture needle to the ultrasonic transducer.

As indicated below with the aid of the attached drawings, the present invention as recited in the claims has excellent reflected ultrasound return properties even in the shallow angle where

it is especially difficult to return the ultrasonic reflected wave to the ultrasonic transducer. Please note, the enclosed drawings are provided merely to illustrate the discussion below and are not meant as amendments, replacements or additions to the figures originally filed in the present application. For this reason, the attached figures are not labeled as "replacement sheets".

The doughnut-shaped recess recited in the claims, as shown in Fig. 1A and Fig. 1B attached herewith, has a column portion at the center. Hence, even in the case where the ultrasonic wave radially emitted from the ultrasonic transducer enters the doughnut-shaped recess with a shallow angle, as shown in Fig. 1A and Fig. 1B, there necessarily exist portions opposing the ultrasonic transducer on the outer periphery of the column portion and on the circular inner periphery. Thus, the reflected wave reflected on the column portion and the reflected wave reflected on the inner periphery necessarily return to the ultrasonic transducer.

In other words, with the doughnut-shaped recess, at least two reflected waves directly return to the ultrasonic transducer for the ultrasonic wave that enters the recess at a shallow angle.

In contrast to this, it is noted in the depression of Hoyns that any column portion does not exist within the depression as shown in Figs. 11A, 11D, 111A, 111B, 11VA and 11VB. Moreover, with respect to the octagonal recess and the ultrasonic transducer, shown in Fig. 11, there does not necessarily exist any portion that opposes the ultrasonic wave emitted with a shallow angle from the ultrasonic transducer such that the reflected ultrasonic wave is reflected directly back to the ultrasonic transducer. Hence, in the case of the octagonal depression, the ultrasonic wave repeats the reflection on a plurality of surfaces, so that the reflected wave returns by chance to the ultrasonic transducer.

Also in the case of the rectangular or diamond-shaped recess, there does not necessarily exist any portion that opposes the ultrasonic wave emitted with a shallow angle from the ultrasonic transducer, as in the octagonal depression. Thus, among the plural arrayed rectangular and diamond-shaped recesses, the inner surfaces of the depressions having portions opposing the ultrasonic wave emitted with a shallow angle from the ultrasonic transducer are very limited.

Hence, in the case of having provided the doughnut-shaped recess, it is possible to surely return even the reflected wave of the ultrasonic wave emitted with a shallow angle from the ultrasonic transducer to the ultrasonic transducer.

Thus, it is possible to widely display the reflection surface of the ultrasonic wave of the puncture needle opposing the ultrasonic transducer under the ultrasonic image observation, thereby improving the visibility of the puncture needle in ultrasonic images.

Therefore, since particular structure and results obtained by using donut-shaped recesses on a puncture needle are non-obvious over the disclosed octagonal, square or diamond shaped depressions, Hoyns, Ouchi and Guess et al., taken alone or in any proper combination, fail to disclose or suggest Applicant's invention as recited in the claims. Accordingly, Applicant respectfully requests withdrawal of the rejections to Claims 1 – 6, 9, 12 – 16 and 18 under 35 U.S.C. § 103(a) over Hoyns in view of Ouchi; and Claims 7 – 8, 10 – 11, 17 and 19 under 35 U.S.C. § 103(a) over Hoyns in view of Ouchi and further in view of Guess et al.

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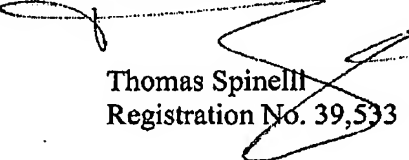
JUN 25 2007

CONCLUSIONS

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1 – 19 are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Applicant's undersigned attorney at the number indicated below.

Respectfully submitted,


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